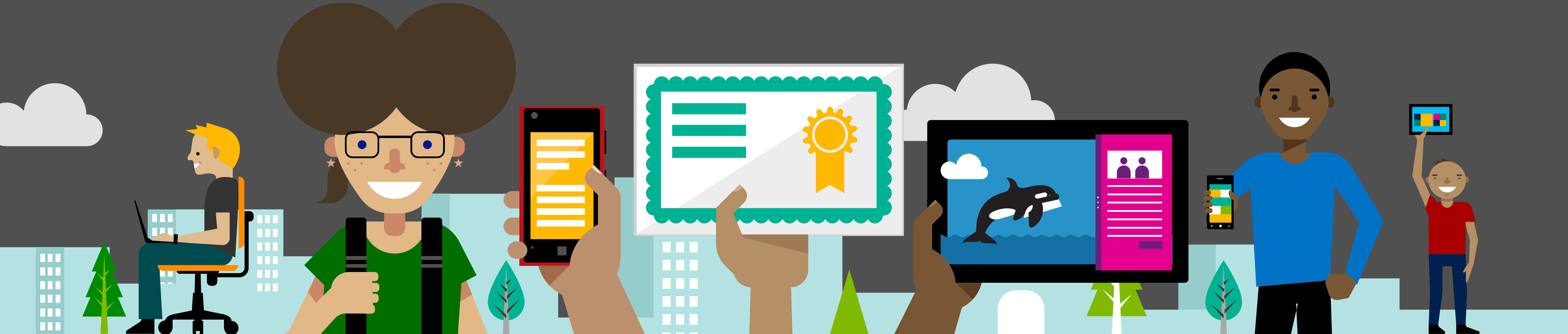
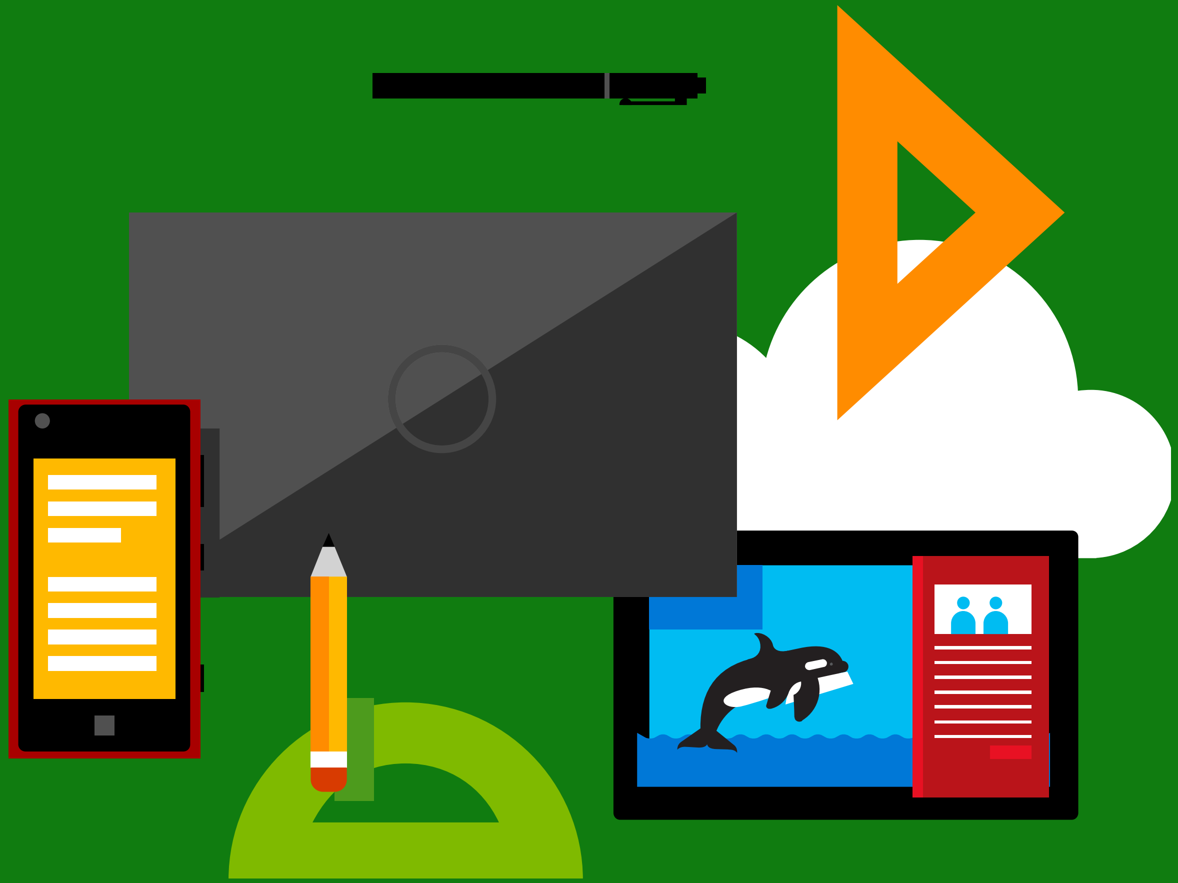
Creating Animations, Working with Graphics, and Accessing Data

4.3. Code animations by using JavaScript.
4.4. Access data access by using JavaScript.



Agenda

Animations



Animation with JavaScript

- **Animation** is the movement of static images to create the effect of movement
- Animation can be used to dynamically move objects in the user interface
- We can leverage JavaScript to create pretty powerful animations

Creating Animations

Awesome HTML-based examples of Animations:

https://msdn.microsoft.com/en-us/library/windows/apps/hh465165.aspx

Great article on MSDN about animations (it’s long!):

https://msdn.microsoft.com/en-us/library/windows/desktop/dn742481.aspx

Canvas + JavaScript

Manipulating the Canvas

- Recall that the canvas element is used to create a container for graphics
- With JavaScript, you can manipulate the container and draw graphics dynamically
- To draw a canvas object, you use the `getElementById()` function to access the canvas and the `canvas.getContext` to create the object

Canvas Demo

```
<body>
  <canvas id="myCanvas" width="400" height="100"
style="border:3px solid #c3c3c3;">
   Your browser does not support the canvas element.
</canvas>

  <script type="text/javascript">
      var c=document.getElementById("myCanvas");
      var ctx=c.getContext("2d");
      ctx.fillStyle="Blue";
      ctx.fillRect(5,5,150,75);
   </script>

</body>
```

Example: Cut The Rope

Transmitting Data

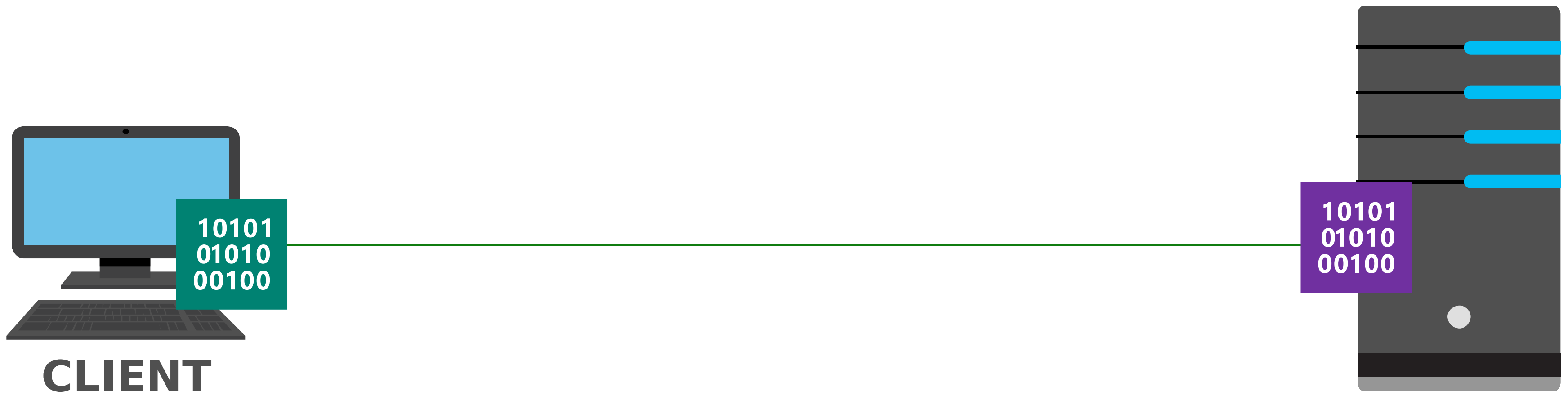
Sending and Receiving Data

Creating robust interactive applications requires the ability to send and receive data

For this to happen, mobile applications and HTML Web pages have to communicate with servers where data is stored

- A user’s computer is commonly called a “client”

JavaScript makes the creation of such programs possible



The XMLHttpRequest API

Uses JavaScript to pass data in the form of text strings between a client and server

- HTML = text strings!!!

Check out the syntax for the load function to the right and note the following:

- xhr is a new XMLHttpRequest object
- the open method specifies the HTTP method for contacting the server and provides the server's Web address
- the callback function gets a response from the server
- the send method sends the data

JavaScrip
t

```
function load(ur
callback) {
    var xhr = new
XMLHttpRequest();
    xhr.open("GET", url, true);
    xhr.onload = function() {

callback(xhr.responseText);
    }
    xhr.send(data);
}
```

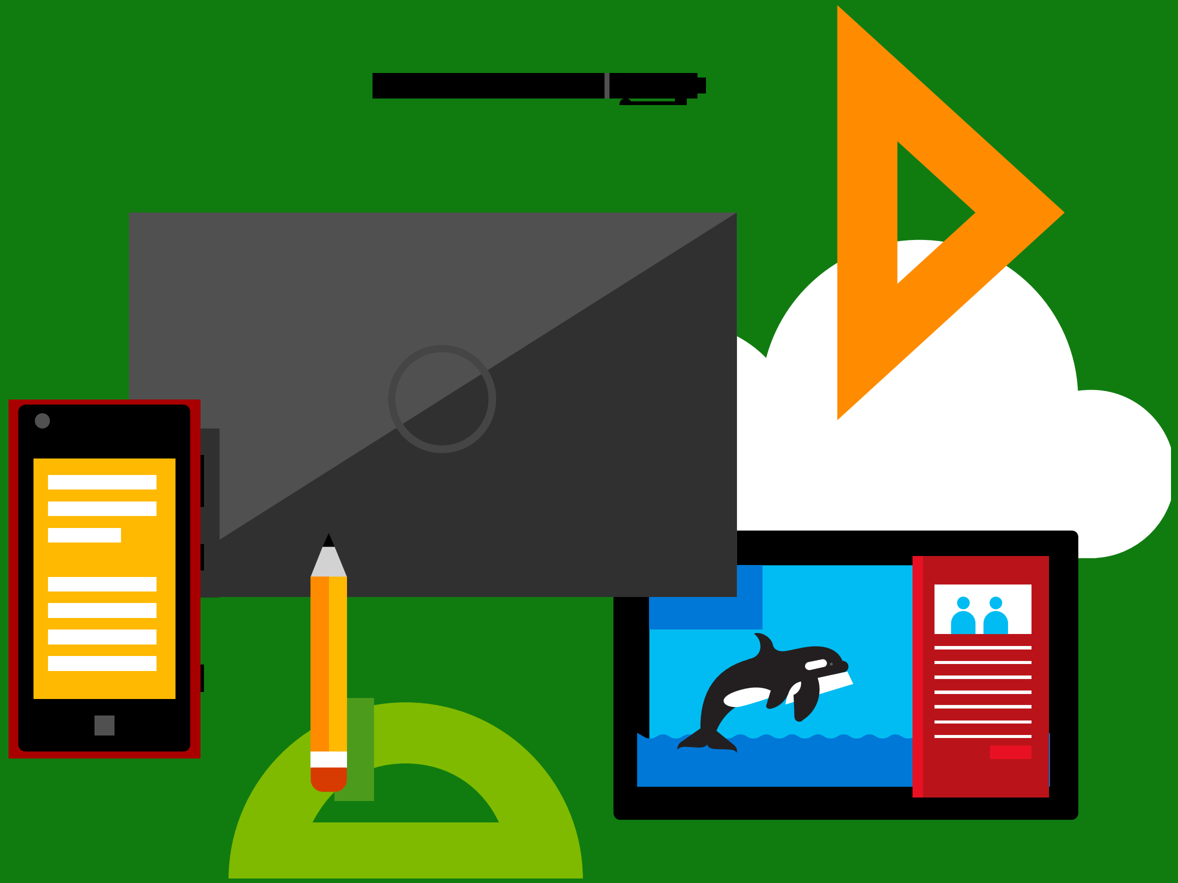
Parsing

- When you send and receive data, you have to **parse** which components will be used
  - Parsing is the analysis of complex information into its smaller parts
- With JavaScript, you have a number of options for parsing data

JavaScript Object Notation (JSON)

- JSON is a subset of JavaScript that is used to exchange JS objects with a server
- It features two APIs: JSON.parse and JSON.stringify
  - When data is received from a server, the .parse API is used to read the data
  - When data is sent by a client, the .stringify API is used to turn data into text strings

Loading and Saving Files



Validating Uploaded Files

VS
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- With JavaScript you can load and save files from your computer
- JavaScript can also be used to validate a file type
  - Example: Users should upload a `.jpg` file, but try to upload a `.doc` file instead

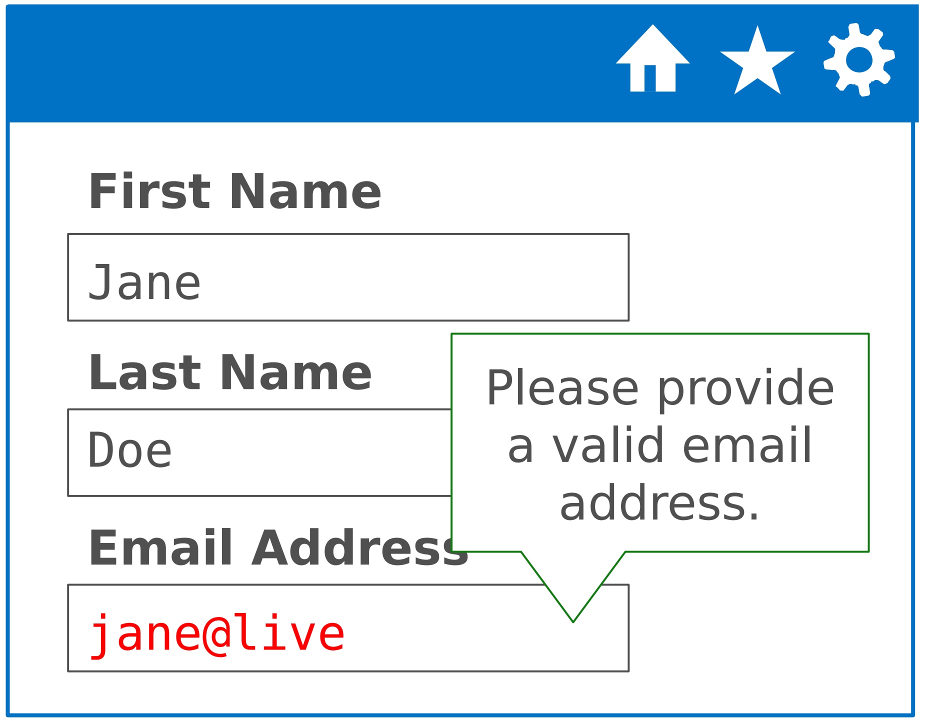
AppCache for Offline Files

- Data can be stored locally when a user is offline using the **Application Cache**, or **AppCache**
- AppCache stores resources, such as HTML, CSS, and JavaScript files, locally on a user's machine
  - As a result, users can access Web pages and apps offline
- The **cache manifest file** dictates which type of information is stored offline

Validating Form Input

Validating User Input

- Form input may be incorrect
  - Example: Users may forget the @ symbol in an email address
- JavaScript can be used to perform client-side validation of form input
  - This occurs in the browser before a form is submitted
- **NOTE:** With HTML5, client-side validation is performed based on the input type



Cookies

Cookies

- Cookies are small text files that that Web sites save on your computer
  - They contain information about you and your preferences
- With JavaScript you can store and retrieve information from cookies

Agenda

1 Animations

2 Canvas + JavaScript

3 Transmitting Data

4 Loading and Saving Files

5 Validating Form Input

6 Cookies

Microsoft